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(54) **AN IMPROVED SUPPORT FOR VARIOUS TYPES OF ITEMS**

VERBESSERTER TRÄGER FÜR UNTERSCHIEDLICHE ARTEN VON ARTIKELN

SUPPORT AMÉLIORÉ POUR DIVERS TYPES D'ARTICLES

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Description

Field of the invention

[0001] The present invention relates to the easy connection of electric devices to an electric network and/or a data transmission network.

[0002] In particular, the invention relates to the easy connection of electric devices such as, for example, LED lights, battery chargers, or electronic devices.

Description of the prior art

[0003] Systems exist of electric lighting, as shown for example in IT2009FI00085, which allow an easy connection of LED electric devices to a sandwich-structured panel connected to the electric network.

[0004] In particular, in the cited document the sandwich-structured panel comprises two metal panels separated by an insulating panel. In one of the two metal panels holes are provided that allow the introduction of cylindrical plugs connected to the above described electric devices. The connection to the electric network allows the two metal panels to have opposite polarities and to supply the cylindrical plugs in the holes, allowing the LED lights to turn on.

[0005] However, this system has various functional drawbacks and drawbacks of safety.

[0006] Firstly, the insulating panel is made of plastic material or wood. These materials, stiff itself, require also a high thickness to ensure an appropriate insulation, stiffening further the structure. Therefore, the sandwich-structured panel does not present any flexibility and does not allow to be fitted to irregular surfaces or to be shaped in predetermined shapes. Furthermore, in order to keep the panels together, an external frame is necessary that provides further stiffness to the structure, and complicates structurally the production of the system.

[0007] Another critical point is the electric insulation in the holes. In these points, in fact, the metal panels are very closed to each other and have both their own conductive surfaces exposed. To this purpose the invention provides an insulating layer around the jack of the cylindrical plug, in order to avoid that a wrong introduction of the plug in the sandwich panel can cause the system to short-circuit. This solution, however, is only partial and does not avoid the possibility of a short-circuit due to the introduction in the holes of conductive objects or liquids.

[0008] A further functional problem is that the conductivity between the plug and the perforated panel is due to a little metallic wire that continuously scrapes on the panel. The metallic wire makes instable the attack of the plug and, especially, with the use it risks to break and to get in touch with the lower panel causing a short-circuit. In addition, the invention provides that the jack is connected to a copper wire that is forced to pass through the spring. However, when the spring is in compression the wire could go between the coils of the spring, risking the breaking of the wire, or in any case risking to jeopardize the correct operation of the system.

[0009] Finally, a further drawback of the above described invention is that only exclusively electric devices can be connected to the cylindrical plugs. It is not therefore possible a data connection of devices (flash memories, hard disks, smartphones, etc.) to a network of data transmission connected to a computer, or other devices.

[0010] Another example of system for managing electric devices is shown in US2013044501.

[0011] With reference to Fig. 53, also US2013044501 provides an insulating layer 165 around the "protruding contact" 164, in order to avoid the electric contact between the apertures 153. However, analogously to IT2009FI00085, this solution doesn't avoid the possibility of a short-circuit due to the introduction in the holes of conductive objects or liquids, in addition to the possibility of short-circuits due to a wrong introduction of the "protruding contact" 164.

[0012] Furthermore, US2013044501 doesn't explicitly describe exemplary embodiments that show a possible inventive solution for data transmission.

Summary of the invention

[0013] It is therefore a purpose of the present invention to provide a system for managing electric devices that provides an appropriate safety standard, preventing from short circuiting the electric plant.

[0014] It is also a purpose of the present invention to provide such a system that is versatile and adaptable for the installation in different locations and also on not flat surfaces.

[0015] It is still a purpose of the present invention to provide such a system that solves the above mentioned functional problems, improving the simplicity and the use efficiency for a user.

[0016] It is a further purpose of the present invention to provide such a system that allows a data connection of devices, such as flash memories, hard disk, smartphones, or other, to a network of data transmission connected to a computer, or to other devices, or to Internet.

[0017] It is also a purpose of the present invention to provide such a system that allows a speed of data transmission equal to a USB port, and a quick charge of USB devices.

[0018] These and other purposes are achieved by a system for managing electric devices according to claim 1.

[0019] In particular, the first panel is electrically insulated by the second panel by means of an insulating element.

[0020] Advantageously, the insulating element is an insulating glue arranged to constrain the first and the second panel, in such a way to make one integral to the other and to arrange them close to each other. In particular, the first and the second panel are arranged, in use, at a predetermined distance one from the other, advanta-

geously smaller than the thickness of each panel, preferably smaller than the thickness of half panel. This way, the system has a high flexibility, in particular since the layer of insulating element has a thickness very small with respect to the solutions of the prior art and, at the same time, it does not require the presence of an external structure that make integral each other the first and the second panel. Thanks to this high flexibility, it is possible to install the system on non-planar surfaces, or not perfectly regular surfaces, and then adapting the shape of the system to the different needs. In particular, it is possible to install the system on vehicles, adapting the panels to the typically curved shape of the dashboard.

[0021] In an exemplary embodiment of the present invention, the first and the second panel are kept integral each other by a frame. In this case, the insulating element between the two panels simply consists of a layer of air. Such solution is much cheaper than the previous, since the cost of the insulating material is saved. Furthermore, the frame makes easier installing the panels on a wall, or locating them in a support plane, for example on a desk.

[0022] Advantageously, the electric circuit of the system for managing electric devices is connected to a plant for generating energy by means of solar radiation, in order to supply the or each electric device even without a traditional source of electric supply.

[0023] Advantageously, a third panel is provided comprising a plurality of holes and integral to the second panel. In particular, the third panel is located opposite to the first panel with respect to the second panel, in order to allow a connection of the or each electric connection member on both the sides of the second panel. Such solution is particularly advantageous for using the system as a vertical separè, or as a shelf, increasing the surface to which it is possible to connect the electric devices.

[0024] Advantageously, at least a fourth panel is provided arranged in parallel to the first and to the second panel and comprising at least one hole having a diameter that is smaller than the diameter of the or each hole of the first panel. More in detail, the or each fourth panel comprises at least one data transmission line connected to a data circuit, said data transmission line arranged to be connected with the or each electric connection member, in such a way to enable a data transfer between the data circuit and the or each electric device.

[0025] In particular, at least one among the first panel, the second panel, the third panel and the fourth panel has at least one portion of magnetisable material, or ferromagnetic material, and the electric connection member comprises a magnet, or an electromagnet, or a ferromagnetic element. This way, a magnetic, or electromagnetic, field is created arranged to constrain the electric connection member to at least one of said panels.

[0026] Alternatively, the panles are completely made of not ferromagnetic material, for example plastic, and the electric connection member can be constrained to the panels by means of, for example, a screw system, a bayonet coupling, a fixed joint, or similar. Such solution has the advantage to decrease the weight of the whole system and to make safer the constraint with respect to the use of a magnet, in particular in case that the system has to andure strong accelerations. Furthermore, the present exemplary embodiment avoids potential detrimental interferences between the magnetic field produced by the magnet and the electric field of the data transmission circuit.

[0027] Advantageously, a network of an electrically conductive material, for example copper, is provided which is located above and/or below the transmission data panel to limit or eliminate detrimental interferences between the magnetic field produced by the magnet and the electric field of the data transmission circuit.

[0028] Advantageously, each electric connection member comprises a support structure and the second conductor is slidingly mounted with respect to the support structure.

[0029] Advantageously, each electric connection member comprises a layer of elastic material at the portion in contact with the first panel. This way, the connecting element is much more adherent to the panel, avoiding to move or rotate by gravity or by involuntary small forces.

[0030] In particular, is also provided an elastic element arranged to apply an elastic force on the second conductor for causing a translation of the second conductor with respect to the support structure and causing the introduction of the second conductor in the or in each hole for arranging it in contact with the second conductive surface.

[0031] Advantageously, each electric connection member also comprises a third conductor arranged to connect to the transmission data line to allow that the electric device can transmit and/or receive data with said data circuit.

[0032] In particular, each electric connection member has a cavity arranged to house the second conductor and to insulate it by the first conductor. Furthermore, the support structure of the connecting element has a support portion on which rests an enlarged portion of the second conductor.

[0033] Advantageously, each electric connection member comprises a conductor arranged to connect to the or to each data transmission line on the first panel and/or on the second panel, to allow that the electric device can transmit and/or receive data with the data circuit.

[0034] In particular, the first panel comprises a plurality of holes, and the first conductive surface consists of a plurality of portions, each of which lays in a neighbouring area of a hole of the plurality.

[0035] Advantageously, each electric device is selected from the group consisting of:

- an electronic device in very low voltage;
- a device for lighting (CFL, LED, OLED);
- a portable device (smartphone, tablet, notebook);
- a traditional battery charger and/or an induction bat-

tery charger;
- a device supplied by means of USB port or microUSB port or miniUSB port;
- a device for data transmission (RGB light, flash memory, USB device, system DALI, hard disk);
- a device supplied in average voltage by means of an inverter.

Brief description of the drawings

[0036] Further characteristic and/or advantages of the present invention are more bright with the following description of some exemplary embodiments, exemplifying but not limitative, with reference to the attached drawings in which:

- Fig. 1 shows a perspective view of a first exemplary embodiment, according to the invention, of the first and of the second panel, and of the insulating material;
- Fig. 2A shows a cross sectional view of the exemplary embodiment of Fig. 1 of the first and of the second panel, and of the insulating material;
- Fig. 2B shows a detail of Fig. 2A;
- Fig. 3 shows a perspective view of a first exemplary embodiment, according to the invention, of the electric connection member;
- Fig. 4A shows a cross sectional view of an exemplary embodiment of the system for managing electric devices, according to the invention, where the electric connection member is not centred in a hole;
- Fig. 4B shows a cross sectional view of an exemplary embodiment of the system for managing electric devices of Fig. 4A, where the electric connection member is centred in a hole;
- Fig. 5A shows a cross sectional view of a further exemplary embodiment of the first and of the second panel and of the insulating material;
- Fig. 5B shows a detail of Fig. 5A;
- Fig. 6A shows a cross sectional view of another exemplary embodiment of the first and of the second panel, wherein an external frame is provided;
- Fig. 6B shows a detail of Fig. 6A;
- Fig. 7A shows a cross sectional view of a further exemplary embodiment of the system for managing electric devices, according to the invention, where the electric devices can be connected on both sides of the second panel;
- Fig. 7B shows a detail of Fig. 7A;
- Fig. 8A shows a cross sectional view of another exemplary embodiment of the system for managing electric devices, according to the invention, wherein a further panel with a data transmission line is provided, and where the electric connection member is not centred in a hole;
- Fig. 8B shows a detail of Fig. 8A;
- Fig. 8C shows a cross sectional view of an exemplary embodiment of the system for managing electric devices of Fig. 8A, where the electric connection member is centred in a hole;
- Fig. 9A shows a perspective view of an exemplary embodiment of the system of Fig. 1, wherein a data transmission line on the first panel is provided;
- Fig. 9B shows a cross sectional view of an exemplary embodiment of the system for managing electric devices comprising the panels shown in Fig. 9A;
- Fig. 10A shows a cross sectional view of an exemplary embodiment of the system for managing electric devices, according to the invention, wherein a further panel for data transmission is provided , and where the electric connection member is not centred in a hole;
- Fig. 10B shows a cross sectional view of an exemplary embodiment of the system for managing electric devices of Fig. 10A, where the electric connection member is centred in a hole;
- Figs. 11A and 11B show further exemplary embodiments of the system, wherein alternative systems for data transmission are provided;
- Fig. 12 shows a perspective view of an exemplary embodiment of the system of Fig. 9A, wherein a plug is provided arranged to connect the system to the electric current and to a source of data transmission;
- Fig. 13 shows a cross sectional view of the exemplary embodiment to grip of Fig. 12;
- Fig. 14 shows a top plan view of a modular structure made connecting to each other more systems for managing electric devices;
- Fig. 15 shows a cross sectional view of the connection between two plugs, in such a way to provide the modular structure of Fig. 14.

Description of a preferred exemplary embodiment

[0037] With reference to Figs. 1, 2A and 2B, in a first exemplary embodiment, the system 100 for managing electric devices, according to the invention, comprises a first panel 110 having a plurality of holes 113, and a second panel 120, parallel to the first panel 110. The two panels 110 and 120 have respective conductive surfaces 115 and 125 of electrically conductive material.

[0038] In particular, the panels 110,120 can be made of and/or superficially coated by electrically conductive material. In detail, the conductive surface 115 can cover integrally the panel 110, or being split into portions 116 arranged in predetermined zones of the panel 110, in particular in a neighbouring area of the holes 113. In Fig. 1 is schematically shown, as example, a portion 116 in a neighbouring area of a hole 113. However, is provided the possibility of having conductive portions 116 arranged on the panel 110 according to a predetermined layout. This layout can provide a predetermined number of portions 116 having a predetermined size and extending in the neighbouring area of at least one hole 113.

[0039] Like the conductive surface 115, also the conductive surface 125 can cover integrally the panel 120,

or being split into portions 126 localized at the holes 113. In both cases, the overlap of the two panels 110 and 120 leaves uncovered the portions 126 of the surface 125, which are accessible from the outside through the holes 113.

[0040] The panels 110 and 120 are connected to an electric circuit 10 that provides opposite polarity to the two conductive surfaces 115 and 125.

[0041] In the present exemplary embodiment between the two panels 110,120 an insulating element 140 is located that prevents from a short circuit of the circuit 10. Such insulating element 140 can be a gluing substance that, besides to insulate the panels 110 and 120, also allows to keep them integral and close each other . In particular, the technical solution used reduces the thickness of the insulating element 140 with respect to other solutions of the prior art, such as panels of material not electrically conductive. For example, for panels 110,120 of about 1 mm of thickness, satisfactory results are obtained with a thickness of the insulating element 140 of 0.2-0.3 mm.

[0042] Furthermore, the reduced thickness of the insulating material allows to use panels 110,120 of flexible material, in such a way to allow an installation of the system 100 on non-planar surfaces, or not perfectly regular surfaces, and then adapting the shape of the system 100 to the different needs. In particular, it is possible to install the system 100 in vehicles, adapting the panels to the typically curved shape of the dashboard.

[0043] In any case, it is provided by the present invention also the possibility to use as insulating material 140 any desired material able of avoid the electric connection of the panels 110,120. In particular, a cheap solution uses polystyrene as insulating material. Such material is also particularly sound absorbing, causing the system 100 to be suitable for be used, for example, as *separé,* or as soundproofing element. In this case, for increasing the acoustic insulation produced by the system 100, a further panel of sound absorbing material can be provided located next to the panel 120.

[0044] With reference to Figs. 3, 4A and 4B, the system 100 also comprises an electric connection member 150 that connects the two conductive surfaces 115 and 125, closing the electric circuit 10 and allowing the supply of an electric device 160, for example a LED light in Figs. 4A and 4B.

[0045] In particular, the electric connection member 150 comprises a first conductor 154, a second conductor 155, a support structure 152 and a cover 151.

[0046] As shown in Fig. 3, the support structure 152, for example substantially cylindrically shaped, has a cavity 152a arranged to house the second conductor 155 and to insulate it by the first conductor 154. In particular, the support structure 152 has a support portion 152b on which an enlarged portion 155b of the second conductor 155 rests.

[0047] The electric connection member 150 also comprises a spring 158 that produces an elastic force on the second conductor 155, in such a way to cause a portion 155c to exit from the cavity 152a of the support structure 152 through an opening 152c.

[0048] In the exemplary embodiment of Figs. 4A and 4B the panel 110 and/or the panel 120 are composed by magnetizable, or ferromagnetic, material and the electric connection member 150 comprises a magnet 157 arranged to magnetize the panel 110 and/or the panel 120, in order to apply a magnetic force that constraints the element 150 to the panels.

[0049] As shown in Fig. 4A, when the electric connection member 150 is located on the panel 110, it is constrained, thanks to the above described magnetic force. if the second conductor 155 is not located at a hole 113, the spring 158 is compressed and the device 160 is not electrically supplied.

[0050] With reference to Fig. 4B, displacing the electric connection member 150 on the surface of the panel 110, when the second conductor 155 is arranged at a hole 113, portion 155c protrudes, thanks to the spring 158, outside of the cavity 152a through the opening 152c.

[0051] In this situation, the second conductor 155 touches the conductive surface 125 on the panel 120, and in particular with one of the portions 126 not covered. The first conductor 154 remains in contact with the conductive surface 115 on the panel 110. This way, the electric device 160, electrically connected to the two conductors 154 and 155 by two interface 159, for example two welding points, closes the circuit 10 and is electrically supplied.

[0052] To avoid that the wires that connect the electric device 160 and the welding points 159 twist each other, risking to break, the conductor 155 may have a head square section 155a, visible in Fig. 3, that is arranged to move through the hole 151a obtained in the cover 151. This way, it is prevented the relative rotation between cover 151 and the conductor 155 when the conductor 155 translates, entering or exiting from the holes 113.

[0053] To electrically insulate the conductor 154, a cover with some layers of insulating material is provided. In particular, there is a layer of insulating material 156a that insulates the conductor 154 on all its outer surface, in order to prevent that a user, or any object, can be contact with the conductor 154 when it is crossed by electric current. Another layer of insulating material 156b is located on the inner surface of the conductor 154, in order to avoid an electric contact with the magnet 157, and avoid interferences in the electric circuit.

[0054] Furthermore, the support structure 152 and the cover 151 can be made in insulating material, in such a way to avoid the indirect electric contact between the two conductor 154 and 155 and between the conductor 155 and the magnet 157.

[0055] As shown in Figs. 4A and 4B, in this exemplary embodiment the conductor 154 protrudes towards the panels 110,120 more than the magnet 157, in order to avoid the contact between the magnet 157 and the panels. Alternatively, the magnet 157 can be covered by a

further insulating layer also in the lower part to avoid the contact with the panels 110,120.

[0056] Furthermore, if the panels 110 and 120 are made or coated with conductive material also at the inside of the holes 113, an exemplary embodiment of the present invention provides that portion 155c of the conductor 155 is coated by a layer of insulating material 156c (see Fig. 4B). More in detail, the insulating material 156c prevents that the conductive surface 115 of the panel 110 is accidentally electrically connected to the conductive surface 125 of the panel 120, causing the short-circuit of the circuit 10.With reference to Figs. 5A and 5B, another possible solution to the problem of an accidental short-circuit of the circuit 10 provides that the wall 113a delimiting each hole 113 is coated with a layer of insulating material 114. In this case, unlike the prior art, it is possible to avoid also a short circuit due to the wrong introduction of conductive objects or liquids in the holes 113.

[0057] With reference to Figs. 6A and 6B, a possible exemplary embodiment of the invention provides that the panels 110 and 120 are kept integral each other by a frame 141, and that the insulating element 140 that insulates the two panels consists of an air layer. Such solution is much cheaper than the previous, since is the cost of the insulating material is saved. Furthermore, the frame 141 makes easier installing the panels 110,120 on a wall, or locating them in a plane support, for example on a desk.

[0058] With reference to Figs. 7A and 7B, in a further exemplary embodiment of the invention, a third panel 110' is provided having a plurality of holes 113' and being integral to the panel 120. The panel 110' is located at the opposite side respect to the panel 110, and essentially it has the same functions, so that the electric devices can be connected at both the sides of the panel 120.

[0059] With reference to Figs. 8A, 8B and 8C, a further exemplary embodiment of the invention provides a fourth panel 130 located between the panels 110 and 120 and comprising at least one data transmission line 131 connected to a data circuit 20.

[0060] In particular, the fourth panel 130 also is provided with a plurality of holes 123, which have a smaller diameter than the holes 113 on the panel 110, in order to allow that an electric connection member 150 can be in contact with all the three panels 110, 120 and 130.

[0061] More in detail, in this exemplary embodiment the electric connection member 150 comprises a third conductor 153 arranged to connect to the data transmission line 131, in order to allow that the electric device 160 can transmit data with the data circuit 20.

[0062] Similarly to the second conductor 155, the third conductor 153 is associated with at least one spring, for example two springs 158a and 158b arranged at opposite sides with respect to it, and arranged to elastically force the third conductor 153 to protrude from the support structure 152 through at least one opening 153c. As schematically shown for example in Fig. 8A, the third conductor 153 may have a substantially cylindrical geometry and surround, in use, the second conductor 155, and the opening 153c may be substantially ring shaped.

[0063] In particular, when the connecting element 150 is centred in a hole 113, the second conductor 155 is pushed by the spring 158 to contact the conductive surface 125, whereas the third conductor 153 is pushed by the springs 158a and 158b to contact the data transmission line 131 on the panel 130.

[0064] The data transmission line 131 is also split into two branches, allowing the conductor 153 to connect to two different data channels. A first part of the conductor 153 (for example the right part in Fig. 8A) can be connected to a first data channel, whereas the other part of the conductor 153 (for example the left part in Fig. 8A) can be connected to the second data channel. The two data channels are then connected to the electric device 160 by two interface elements 159a. To assist the fastening of the connecting element 150 and to prevent that the data channels can be reversed each other, an exemplary embodiment of the present invention provides that the holes 113 have a cross section substantially half moon shaped, and that the conductor 153 has the same shape.

[0065] In particular, a device 160 arranged to receive and/or transmitting data, for example a flash memory, an hard disk, a smartphone, a tablet, or other, can be associated with an electric connection member 150 arranged for the data transmission, in such a way to transmit data to the data circuit 20, which in turn can be connected, for example, to a USB port of a computer or to Internet. This way, the device 160 can both being electrically supplied by the panels 110 and 120, and transmitting data at a speed of a USB device thanks to the panel 130. With respect to a common USB port the charging speed of the device is much higher, since it is the same that you would have connecting the device directly to the electric current. Furthermore, it is possible to connect, with the same system, two or more devices 160 at the same time, so that they can transmit data to each other and/or to the data circuit 20, and being supplied at the same time.

[0066] With reference to Figs. 9A and 9B, an variant of the exemplary embodiment of Figs. 8A, 8B and 8C provides that on the panel 110 there are, for example printed, two data transmission lines 111 and 121 arranged to transmit data between an electric device 160 and a network data 20 connected for example to a computer. As said above, it is also possible connecting more devices 160 and put them in connection data to each other and/or with the data circuit 20, and at the same time supply the devices 160. In this exemplary embodiment, the connecting element 150 has a conductor 253 that overlaps the data transmission lines 111 and 121, allowing the device 160 to transmit data with the data circuit 20. In the Figs. 10A and 10B another variant of the exemplary embodiment of Figs. 8A, 8B and 8C is shown that provides that the panel 130 comprises two plates 130a,130b insulated each other, and connected, respec-

tively, to the data transmission lines 111 and 121. This way, the two plates 130a,130b act as different poles of data transmission , in a similar way as it is carried out with the panels 110 and 120 concerning the transmission of electric current. In this exemplary embodiment, the electric connection member 150 has a fourth conductor 153a, in such a way that the third conductor 153 and the fourth conductor 153a are connected to the two plates 130a,130b and therefore to the two data transmission lines 111 and 121.

[0067] In the figures 11A and 11B a further variant of the exemplary embodiment of Figs. 8A, 8B and 8C is shown, where the data transmission is made through the conductors 353a and 353b that touch the data transmission lines 111 and 121. In particular, the exemplary embodiment of Fig. 11A provides that the conductors 353a and 353b are integral to the conductor 155, whereas the exemplary embodiment of Fig. 11B provides that the conductor 155 can slide between the conductors 353a and 353b to come in contact with the panel 120 more safely.

[0068] With reference to Fig. 12, in an exemplary embodiment further, the system 100 can provide a display 300 that sums up the status of the sockets (speed of data transmission, status of charge of a device) and that allows scheduling the activation of the system 100.

[0069] The data transmission lines 131 can be in parallel or in series, depending on the needs to optimize the amount of data to be transmitted..

[0070] Furthermore, a plug 350 can be provided for connecting the system 100 both to the electric network, both to various source data, such as wifi network, ethernet network, GSM network, or USB port of a computer or of a portable device.

[0071] The plug 350 can, for example, comprise a connector like that shown in Fig. 13. Such solution allows the plug to connect and disconnect like an electric connection member 150. In this exemplary embodiment, it is provided that the panel 110 is drawn at the holes 113 and that laterally to plug 350 walls 351 are provided arranged to avoid that conductors 154 and 155 can touch at the same time the panel 110. In this case, in fact, since the plug 350 transmits electric current to the system 100, you could have a short-circuit of the electric plant.

[0072] With reference to Figs. 14 and 15, the present invention provides also that the system 100 is electrically connected to other similar systems 100, by the connection of plugs 350, in order to form a modular structure 500. In this case, the panels 110 and 120 of the different systems 100 can be connected each other in parallel or in series depending on the needs, avoiding the presence of wires and cables.

[0073] This way, it is possible to make modular structures at will, according to the architectural requirements of the environment where the systems 100 have to be installed.

[0074] The present invention provides also the possibility of combining the different exemplary embodiments described above with reference to Figs. 1 to 15.

[0075] The foregoing description of specific exemplary embodiments will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt in various applications the specific exemplary embodiments without further research and without parting from the invention, and, accordingly, it is meant that such adaptations and modifications will have to be considered as equivalent to the specific embodiments. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. it is to be understood that the phraseology or terminology that is employed herein is for the purpose of description and not of limitation.

Claims

1. A system (100) for managing electric devices comprising:

- a first panel (110) having at least one hole (113) and having a first conductor surface (115) defined at least in a neighbouring area of said or each hole (113), said or each hole (113) being laterally defined by a wall (113a);
- a second panel (120) integral and substantially parallel to said first panel (110), said second panel (120) having a second conductive surface (125), said first panel (110) being overlapped, in use, to said second panel (120);

said first and second panel (110,120) being made of electrically conductive material,

said system (100) being configured in such a way that said second conductive surface (125) has at least one portion (126) not covered by said first panel (110) and accessible through said or each hole (113),

said first conductive surface (115) and said second conductive surface (125) being connected to an electric circuit (10) in such a way that said first conductive surface (115) has a first predetermined polarity, and said second conductive surface (125) has a second predetermined polarity, opposite to said first predetermined polarity,

said wall (113a) being electrically connected to said first conductive surface (115) and being coated by a layer of insulating material (114) arranged to avoid that said wall (113a) and said second conductive surface (125) are accidentally electrically connected causing the short circuit of said electric circuit (10),

said system (100) for managing electric devices comprising furthermore at least one electric connection member (150) arranged to electrically connect said first conductive surface (115) and said second conductive surface (125) to an electric device (160),

in such a way to close said electric circuit (10) and electrically supply said electric device (160);
said system (100) for managing electric devices **characterized in that** said electric connection member (150) comprises:

- a first conductor (154) arranged, in use, to be connected with said first conductive surface (115);
- a second conductor (155) arranged to enter in said or in each hole (113) for arranging, in use, in contact with said second conductive surface (125), said first conductor (154) having an annular section and externally surrounding said second conductor (155)

2. System (100) for managing electric devices, according to claim 1, wherein said first panel (110) is electrically insulated by said second panel (120) by means of an insulating element (140), said insulating element (140) being an insulating glue arranged to constrain said first and second panel (110,120), in such a way to make them integral with one another and arrange them close each other.

3. System (100) for managing electric devices, according to claim 1, wherein a third panel (110') is provided comprising a plurality of holes (113') and integral to said second panel (120), said third panel (110') located at the opposite side of said first panel (110) with respect to said second panel (120), in such a way to enable a connection of said or each electric connection member (150) on both the sides of said second panel (120).

4. System (100) for managing electric devices, according to claim 1, wherein at least one data panel (130) is provided arranged in parallel to said first and second panel (110,120) and comprising at least one hole (123) having a diameter that is smaller than the diameter of said or each hole (113) of said first panel (110), said or each data panel (130) comprising at least one data transmission line (131) connected to a data circuit (20), said data transmission line (131) arranged to be connected with said or each electric connection member (150), in such a way in order to enable a data transfer from said data circuit (20) to said or each electric device (160).

5. System (100) for managing electric devices, according to claim 1, wherein at least one among said first panel (110), said second panel (120), said third panel (110') and said data panel (130) has at least one portion of magnetisable material, or ferromagnetic material, and said electric connection member (150) comprises a magnet, or an electromagnet, or a ferromagnetic element, in such a way that a magnetic, or electromagnetic, field is generated arranged to constrain said electric connection member (150) to at least one of said panels (110,120,130,110').

6. System (100) for managing electric devices, according to claim 1, wherein said or each electric connection member (150) comprises a support structure (152) and said second conductor (155) is slidingly mounted with respect to said support structure (152), and where, furthermore, an elastic element (158) is provided arranged to apply on said second conductor (155) an elastic force for causing a translation of said second conductor (155) with respect to said support structure (152) and to cause the introduction of said second conductor (155) in said or each hole (113) for arranging it in contact with said second conductive surface (125).

7. System (100) for managing electric devices, according to claim 1, wherein said or each electric connection member (150) also comprises a third conductor (153,253,353a,353b) arranged to be connected to said data transmission line (131) to allow that said electric device (160) can transmit data to and/or receive data from said data circuit (20).

Patentansprüche

1. System (100) zum Verwalten von elektrischen Vorrichtungen, aufweisend:

ein erstes Paneel (110) mit zumindest einem Loch (113) und mit einer ersten leitenden Oberfläche (115), die zumindest in einem benachbarten Gebiet von dem oder jedem Loch (113) definiert ist, wobei das oder jedes Loch (113) durch eine Wand (113a) lateral definiert ist,
ein zweites Paneel (120), das integral mit und im Wesentlichen parallel zu dem ersten Paneel (110) ist, wobei das zweite Paneel (120) eine zweite leitende Oberfläche (125) aufweist, wobei das erste Paneel (110) im Betrieb das zweite Paneel (120) überlappt,
wobei das erste und zweite Paneel (110, 120) aus einem elektrisch leitenden Material gemacht sind,
wobei das System (100) derart konfiguriert ist, dass die zweite leitende Oberfläche (125) zumindest einen Abschnitt (126) aufweist, der durch das erste Paneel (110) nicht bedeckt ist und über das oder jedes Loch (113) zugreifbar ist,
wobei die erste leitende Oberfläche (115) und die zweite leitende Oberfläche (125) mit einer elektrischen Schaltung (10) derart verbunden sind, dass die erste leitende Oberfläche (115) eine erste vorbestimmte Polarität aufweist, und die zweite leitende Oberfläche (125) eine zweite

vorbestimmte Polarität aufweist, die der ersten vorbestimmten Polarität entgegengesetzt ist,
wobei die Wand (113a) mit der ersten leitenden Oberfläche (115) elektrisch verbunden ist und mit einer Schicht eines Isolationsmaterials (114) überzogen ist, die angeordnet ist, um zu vermeiden, dass die Wand (113a) und die zweite leitende Oberfläche (125) versehentlich elektrisch miteinander verbunden sind, wodurch der Kurzschluss der elektrischen Schaltung (10) bewirkt wird,
wobei das System (100) zum Verwalten von elektrischen Vorrichtungen außerdem zumindest ein elektrisches Verbindungselement (150) aufweist, das angeordnet ist, um die erste leitende Oberfläche (115) und die zweite leitende Oberfläche (125) mit einer elektrischen Vorrichtung (160) derart elektrisch zu verbinden, dass die elektrische Schaltung (10) geschlossen wird und die elektrische Vorrichtung (160) mit Strom versorgt wird,
wobei das System (100) zum Verwalten von elektrischen Vorrichtungen **dadurch gekennzeichnet ist, dass** das elektrische Verbindungselement (150) aufweist:

einen ersten Leiter (154), der im Betrieb angeordnet ist, um mit der ersten leitenden Oberfläche (115) verbunden zu sein,
einen zweiten Leiter (155), der angeordnet ist, um in dem oder jedem Loch (113) eingelassen zu sein, um im Betrieb in Kontakt mit der zweiten leitenden Oberfläche (125) den ersten Leiter (154), der einen ringförmigen Abschnitt aufweist und den zweiten Leiter (155) extern umgibt, anzuordnen.

2. System (100) zum Verwalten von elektrischen Vorrichtungen nach Anspruch 1, wobei das erste Paneel (110) durch das zweite Paneel (120) mittels eines Isolationselements (140) elektrisch isoliert ist, wobei das Isolationselement (140) ein Isolationsklebstoff ist, der angeordnet ist, um das erste und zweite Paneel (110, 120) derart zu fixieren, dass sie integral miteinander gemacht und nahe aneinander angeordnet sind.

3. System (100) zum Verwalten von elektrischen Vorrichtungen nach Anspruch 1, wobei ein drittes Paneel (110') vorgesehen ist, das eine Vielzahl von Löchern (113') aufweist und integral mit dem zweiten Paneel (120) ist, wobei das dritte Paneel (110') dem ersten Paneel (110) mit Bezug auf das zweite Paneel (120) gegenüberliegend derart angeordnet ist, dass eine Verbindung von dem oder jedem elektrischen Verbindungselement (150) an beiden Seiten des zweiten Paneels (120) ermöglicht wird.

4. System (100) zum Verwalten von elektrischen Vorrichtungen nach Anspruch 1, wobei zumindest ein Datenpaneel (130) parallel zu dem ersten und zweiten Paneel (110, 120) angeordnet vorgesehen ist und zumindest ein Loch (123) mit einem Durchmesser aufweist, der kleiner als der Durchmesser des oder jedes Lochs (113) des ersten Paneels (110) ist, wobei das oder jedes Datenpaneel (130) zumindest eine Datenübertragungsleitung (131) aufweist, die mit einer Datenschaltung (20) verbunden ist, wobei die Datenübertragungsleitung (131) angeordnet ist, um mit dem oder jedem elektrischen Verbindungselement (150) derart verbunden zu sein, dass ein Datentransfer von der Datenschaltung (20) zu der oder jeder elektrischen Vorrichtung (160) ermöglicht wird.

5. System (100) zum Verwalten von elektrischen Vorrichtungen nach Anspruch 1, wobei zumindest eines unter dem ersten Paneel (110), dem zweiten Paneel (120), dem dritten Paneel (110') und dem Datenpaneel (130) zumindest einen Abschnitt eines magnetisierbaren Materials oder eines ferromagnetischen Materials aufweist, und das elektrische Verbindungselement (150) einen Magnet oder einen Elektromagnet oder ein ferromagnetisches Element derart aufweist, dass ein magnetisches oder elektromagnetisches Feld erzeugt wird, das angeordnet ist, um das elektrische Verbindungselement (150) mit zumindest einem der Paneele (110, 120, 130, 110') zu fixieren.

6. System (100) zum Verwalten von elektrischen Vorrichtungen nach Anspruch 1, wobei das oder jedes elektrische Verbindungselement (150) eine Trägerstruktur (152) aufweist, und der zweite Leiter (155) mit Bezug auf die Trägerstruktur (152) verschiebbar montiert ist, und wobei außerdem ein elastisches Element (158) angeordnet vorgesehen ist, um auf den zweiten Leiter (155) eine elastische Kraft anzuwenden, um eine Translation des zweiten Leiters (155) mit Bezug auf die Trägerstruktur (152) zu bewirken, und um das Einführen des zweiten Leiters (155) in das oder jedes Loch (113) zu bewirken, um ihn in Kontakt mit der zweiten leitenden Oberfläche (125) anzuordnen.

7. System (100) zum Verwalten von elektrischen Vorrichtungen nach Anspruch 1, wobei das oder jedes elektrische Verbindungselement (150) auch einen dritten Leiter (153, 253, 353a, 353b) aufweist, der angeordnet ist, um mit der Datenübertragungsleitung (131) verbunden zu sein, um zuzulassen, dass die elektrische Vorrichtung (160) Daten zu der Datenschaltung (20) übertragen und/oder von dieser Daten empfangen kann.

Revendications

1. Système (100) pour la gestion de dispositifs électriques, comprenant :

   - un premier panneau (110) possédant au moins un trou (113) et présentant une première surface conductrice (115) définie au moins dans une zone avoisinante audit ou à chaque trou (113), ledit ou chaque trou (113) étant défini latéralement par une paroi (113a) ;
   - un deuxième panneau (120) étant incorporé et substantiellement parallèle audit premier panneau (110), ledit deuxième panneau (120) présentant une deuxième surface conductrice (125), ledit premier panneau (110) chevauchant, en cours d'usage, ledit deuxième panneau (120) ;

   lesdits premier (110) et deuxième panneau (120) étant réalisés avec un matériau électro-conducteur, ledit système (100) étant configuré de sorte que ladite deuxième surface conductrice (125) possède au moins une portion (126) non couverte par ledit premier panneau (110) et accessible à travers ledit ou chaque trou (113),
   ladite première surface conductrice (115) et ladite deuxième surface conductrice (125) étant connectées avec un circuit électrique (10) de sorte que ladite première surface conductrice (115) présente une première polarité prédéterminée, et ladite deuxième surface conductrice (125) présente une deuxième polarité prédéterminée opposée à ladite première polarité prédéterminée,
   ladite paroi (113a) étant connectée électriquement à ladite première surface conductrice (115), et étant enrobée par une couche de matière isolante (114) agencée de façon à éviter que ladite paroi (113a) et ladite deuxième surface conductrice (125) soient accidentellement en contact électriquement, en entraînant un court-circuit dudit circuit électrique (10),
   ledit système (100) de gestion d'appareils électriques comprenant en outre au moins un élément de connexion électrique (150) agencé pour connecter électriquement ladite première surface conductrice (115) et ladite deuxième surface conductrice (125) à un appareil électrique (160), de façon à fermer ledit circuit électrique (10) et à alimenter électriquement ledit appareil électrique (160) ;
   ledit système (100) de gestion d'appareils électriques **étant caractérisé en ce que** ledit élément de connexion électrique (150) comprend :

   - un premier conducteur (154) agencé, en cours d'usage, pour être connecté à ladite première surface conductrice (115) ;
   - un deuxième conducteur (155) agencé pour entrer dans ledit ou chaque trou (113) pour agencer, en cours d'usage, un contact avec ladite deuxième surface conductrice (125), ledit premier conducteur (154) possédant une section annulaire et entourant extérieurement ledit deuxième conducteur (155).

2. Système (100) pour la gestion de dispositifs électriques selon la revendication 1, ledit premier panneau (110) étant isolé électriquement par ledit deuxième panneau (120) à l'aide d'un élément isolant (140), ledit élément isolant (140) étant une colle isolante agencée pour contraindre lesdits premier et deuxième panneaux (110, 120) de façon à ce qu'ils soient incorporés l'un avec l'autre et disposés l'un proche de l'autre.

3. Système (100) pour la gestion de dispositifs électriques selon la revendication 1, un troisième panneau (110'), comprenant une pluralité de trous (113'), et incorporé dans ledit deuxième panneau (120), étant prévu, ledit troisième panneau (110') étant situé du côté opposé audit premier panneau (110) relativement audit deuxième panneau (120), de façon à permettre une connexion dudit et chaque élément de connexion électrique (150) sur les deux côtés dudit deuxième panneau (120).

4. Système (100) pour la gestion de dispositifs électriques selon la revendication 1, au moins un panneau de données (130), agencé parallèlement auxdits premier et deuxième panneaux (110, 120) et comprenant au moins un trou (123) d'un diamètre inférieur à celui dudit ou chaque trou (113) dudit premier panneau (110), étant prévu, ledit ou chaque panneau de données (130) comprenant au moins une ligne de transmission de données (131) connectée à un circuit de données (20), ladite ligne de transmission de données (131) étant agencée de façon à être connectée audit et chaque élément de connexion électrique (150), de façon à permettre un transfert de données dudit circuit de données (20) audit et à chaque appareil électrique (160).

5. Système (100) pour la gestion de dispositifs électriques selon la revendication 1, au moins un panneau, parmi ledit premier panneau (110), ledit deuxième panneau (120), ledit troisième panneau (110') et ledit panneau de données (130), possédant au moins une portion de matériau magnétisable, ou de matériau ferromagnétique, et ledit élément de connexion électrique (150) comprenant un aimant, ou un électroaimant, ou un élément ferromagnétique, de façon à créer un champ magnétique ou électromagnétique agencé pour contraindre ledit élément de connexion électrique (150) contre au moins un desdits panneaux (110, 120, 130, 110').

6. Système (100) pour la gestion de dispositifs électri-

ques selon la revendication 1, ledit ou chaque élément de connexion électrique (150) comprenant une structure de support (152) et ledit deuxième conducteur (155) étant monté par coulissement relativement à ladite structure de support (152), et où en outre un élément élastique (158) est agencé pour appliquer sur ledit deuxième conducteur (155) une force élastique de façon à causer d'une part la translation dudit deuxième conducteur (155) relativement à ladite structure de support (152), d'autre part l'introduction dudit deuxième conducteur (155) dans ledit ou chaque trou (113) pour le mettre en contact avec ladite deuxième surface conductrice (125).

7. Système (100) pour la gestion de dispositifs électriques selon la revendication 1, ledit et chaque élément de connexion électrique (150) comprenant également un troisième conducteur (153, 253, 353a, 353b) agencé pour être connecté à ladite ligne de transmission (131) afin de permettre audit appareil électrique (160) de transmettre des données et/ou de recevoir des données dudit circuit de données (20).

Fig. 1

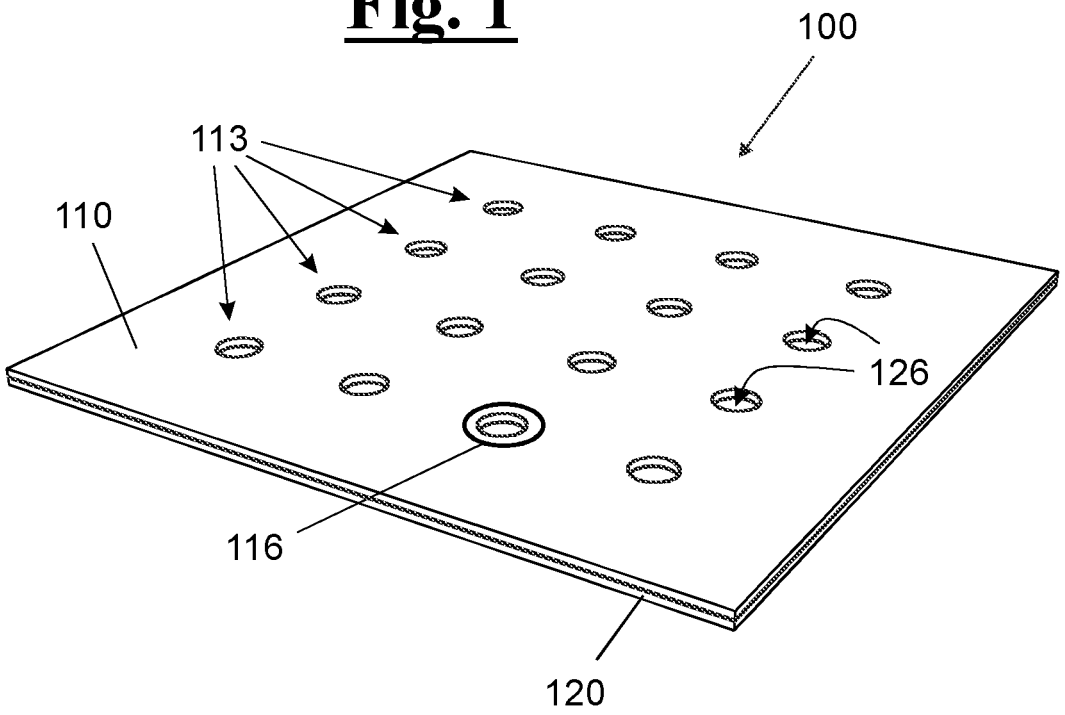


Fig. 2A

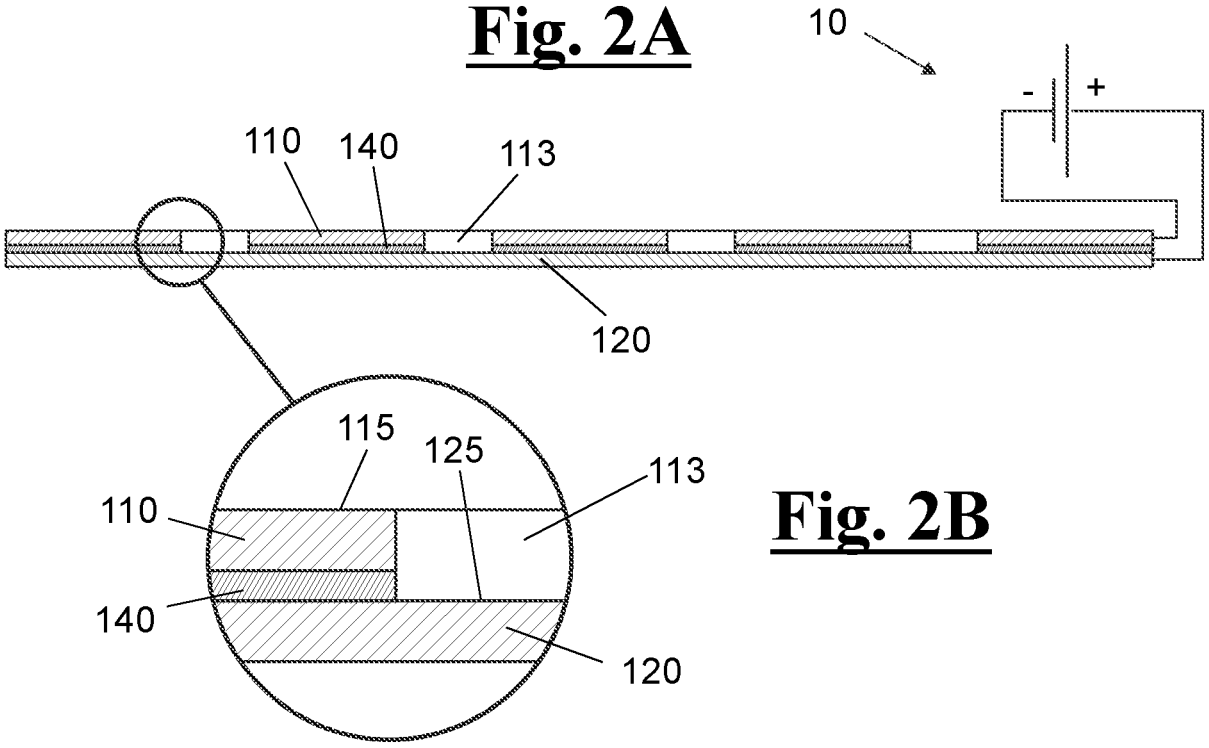


Fig. 2B

Fig. 3

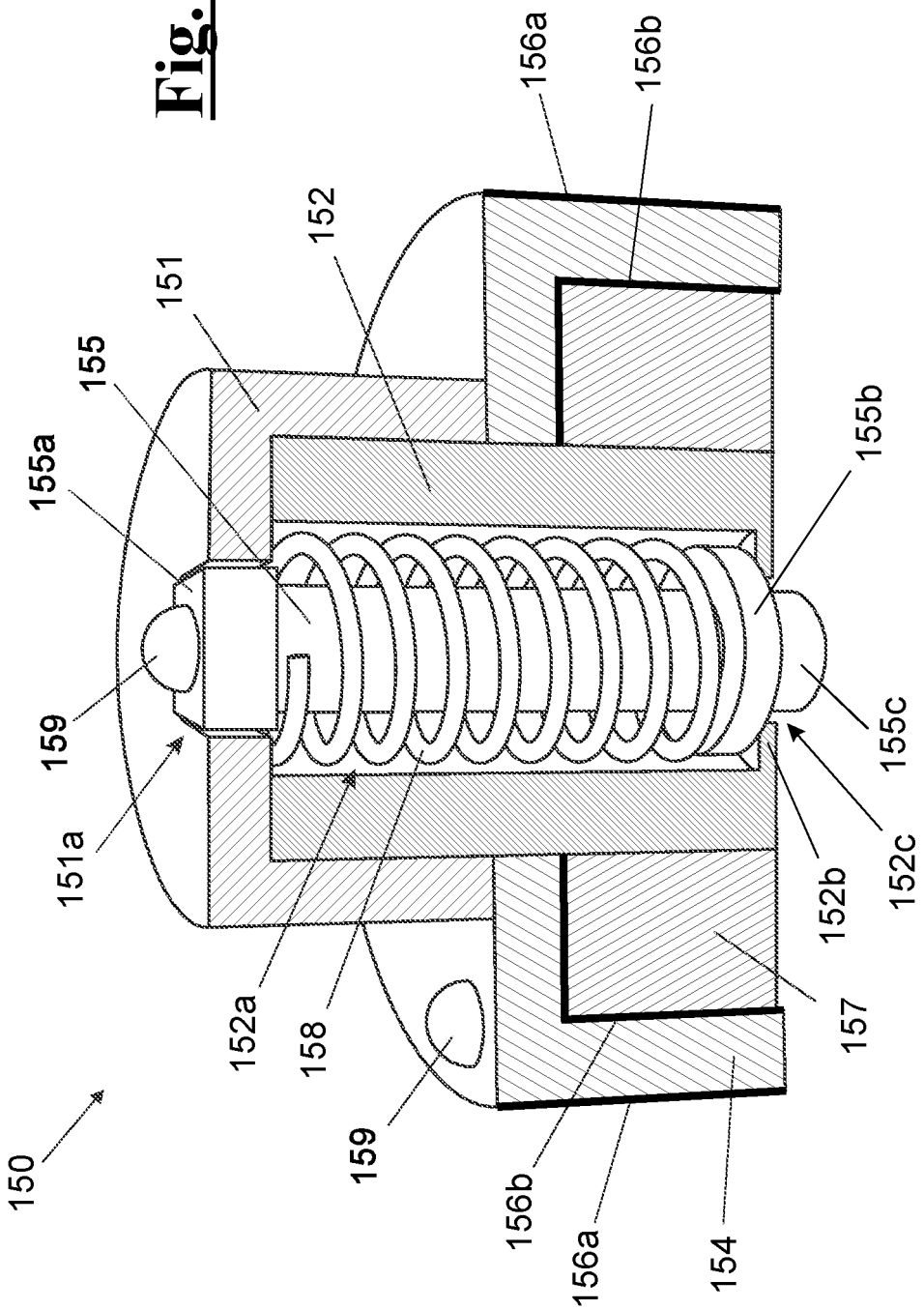
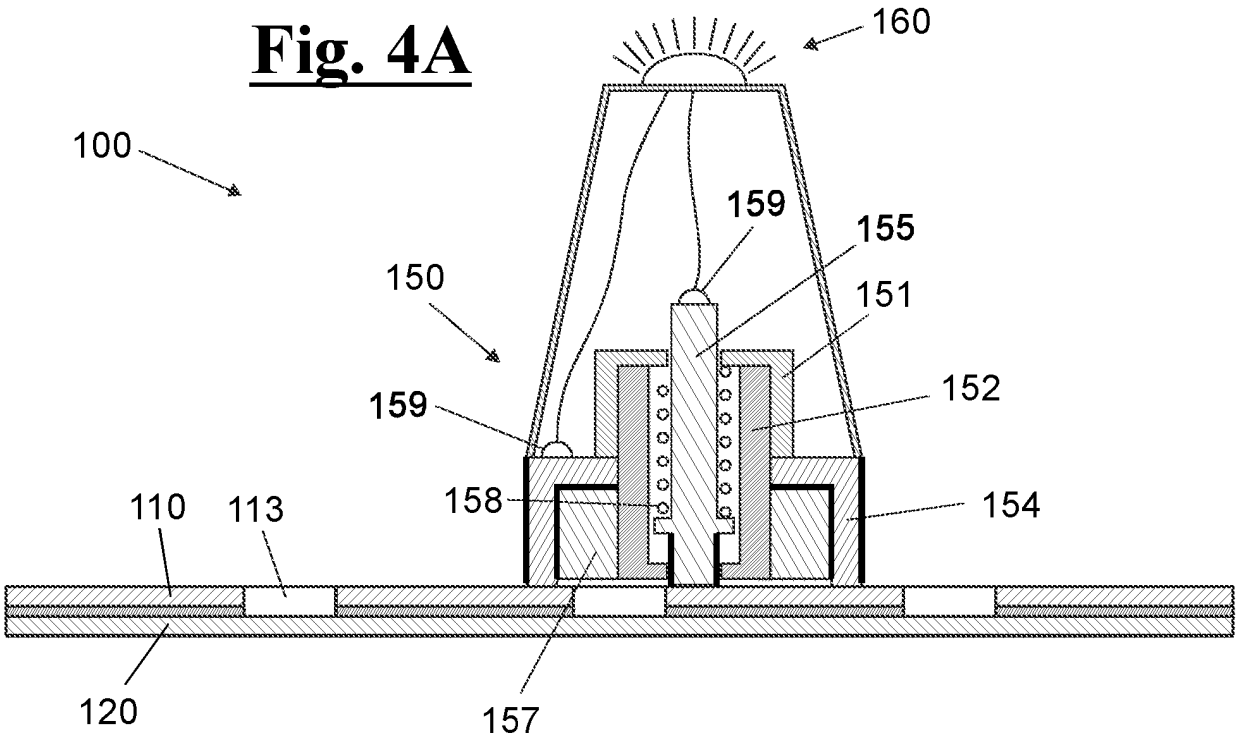

156a
156b
152
151
155
155a
155b
159
151a
155c
152c
152b
152a
158
157
159
150
156b
156a
154

Fig. 4A


160
100
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155
150
151
152
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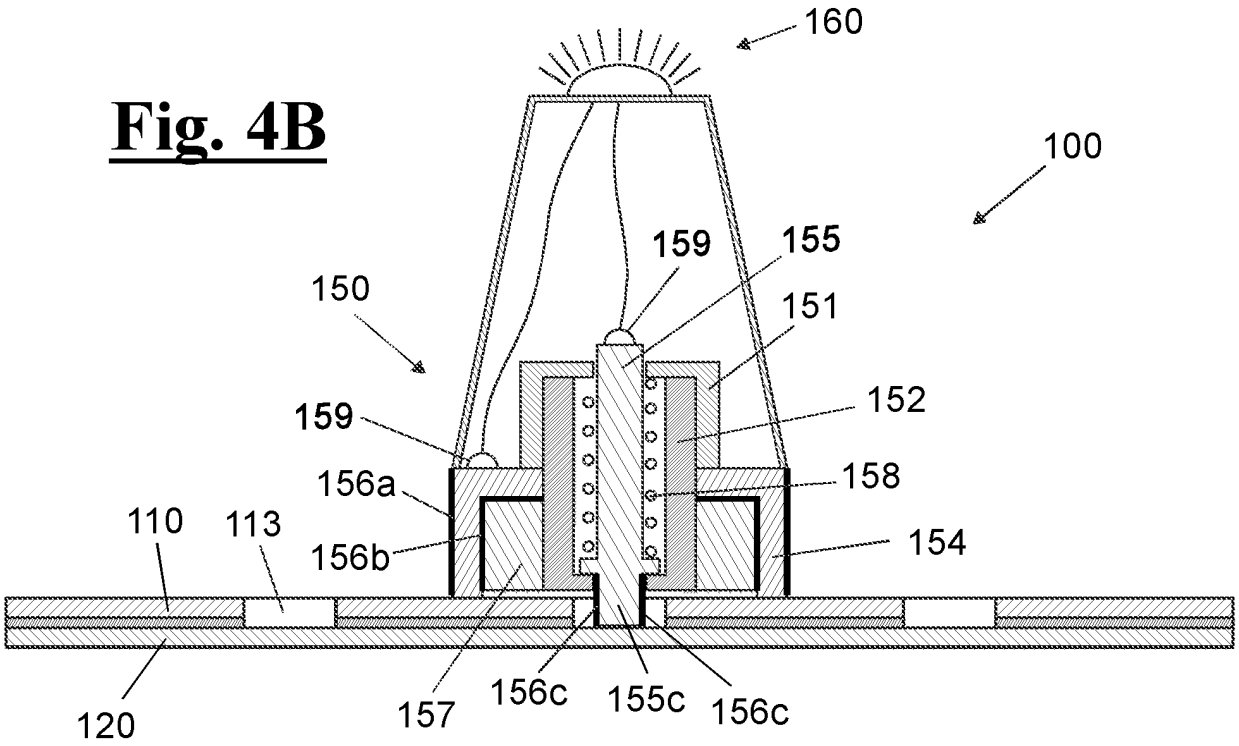
110
113
120
157

Fig. 4B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100
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152
159
156a
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110
113
156b
154
120
157
156c
155c
156c

Fig. 5A

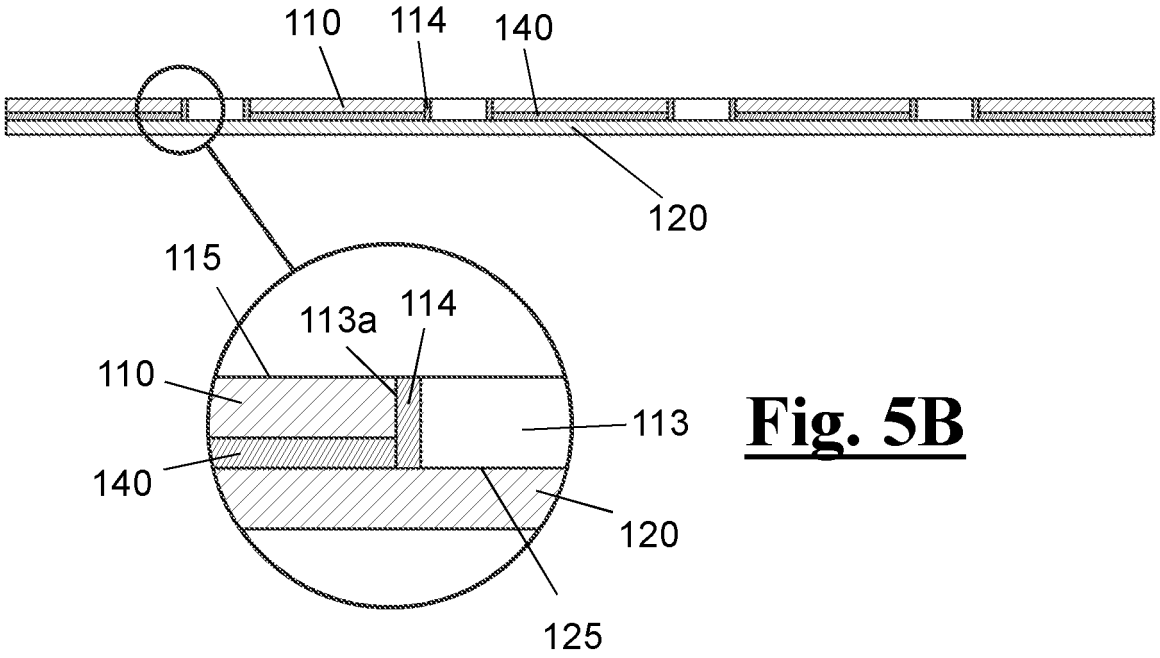


Fig. 5B

Fig. 6A

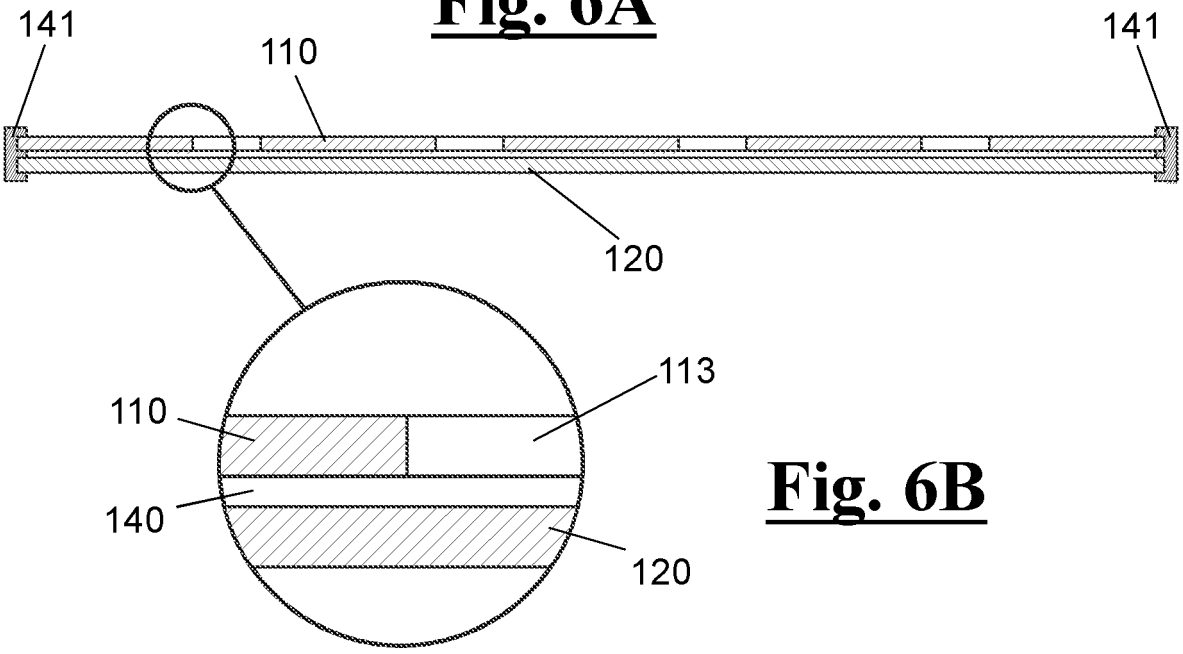
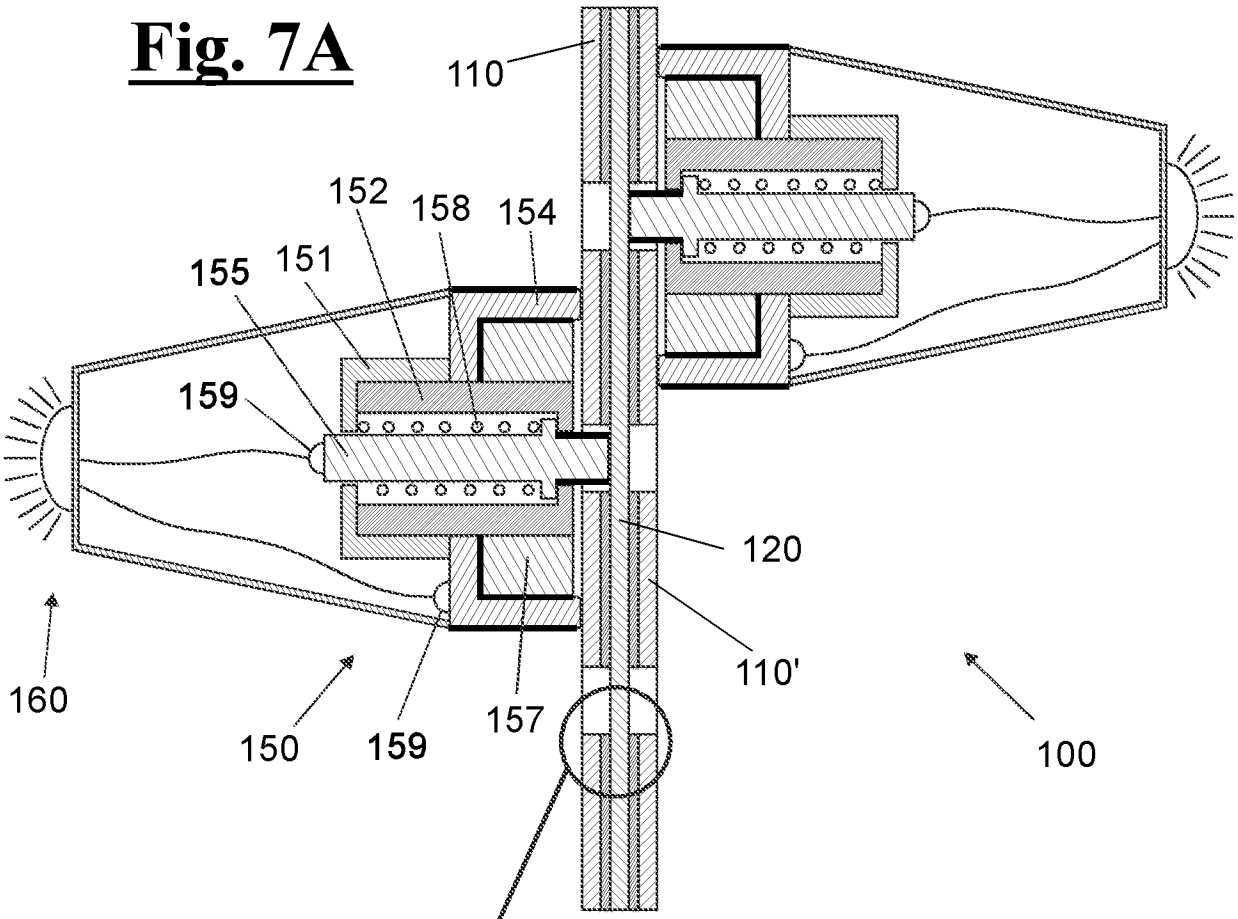


Fig. 6B

Fig. 7A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152
158
154
155
151
159
120
110'
160
150
159
157
100

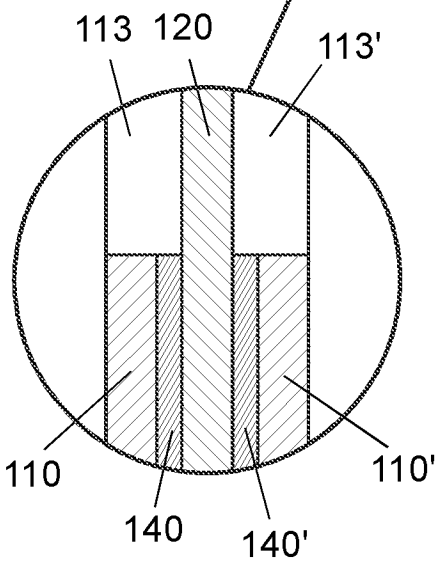

113
120
113'
110
110'
140
140'

Fig. 7B

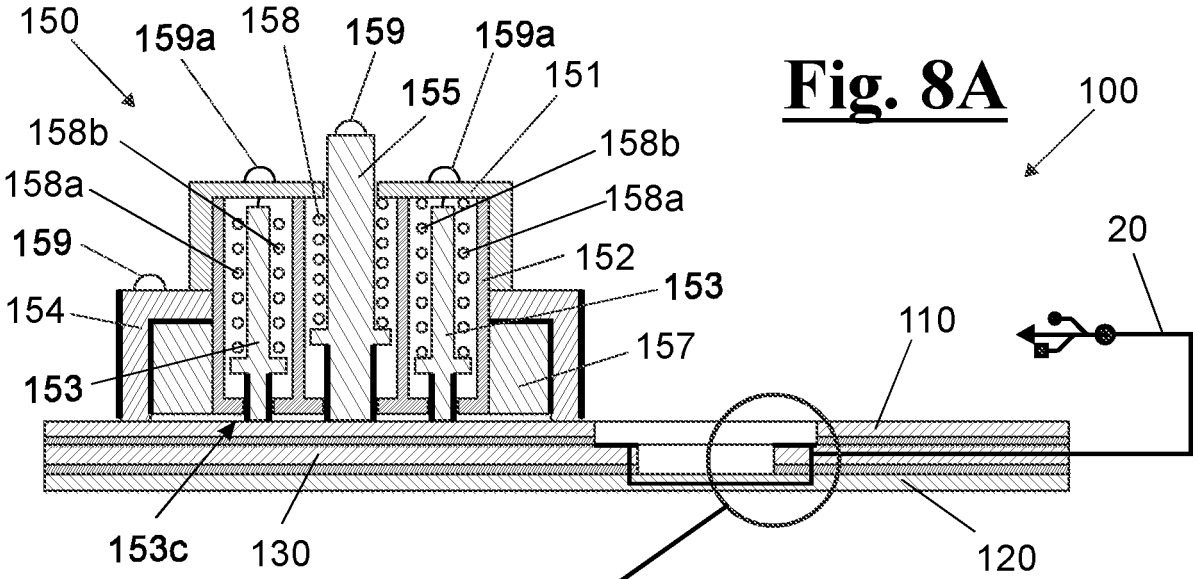


Fig. 8A

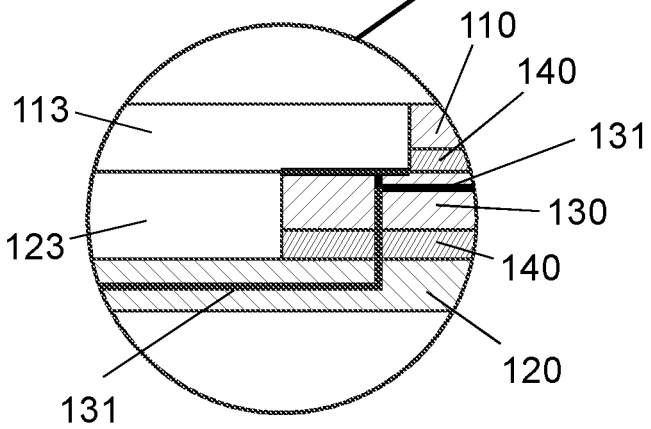


Fig. 8B

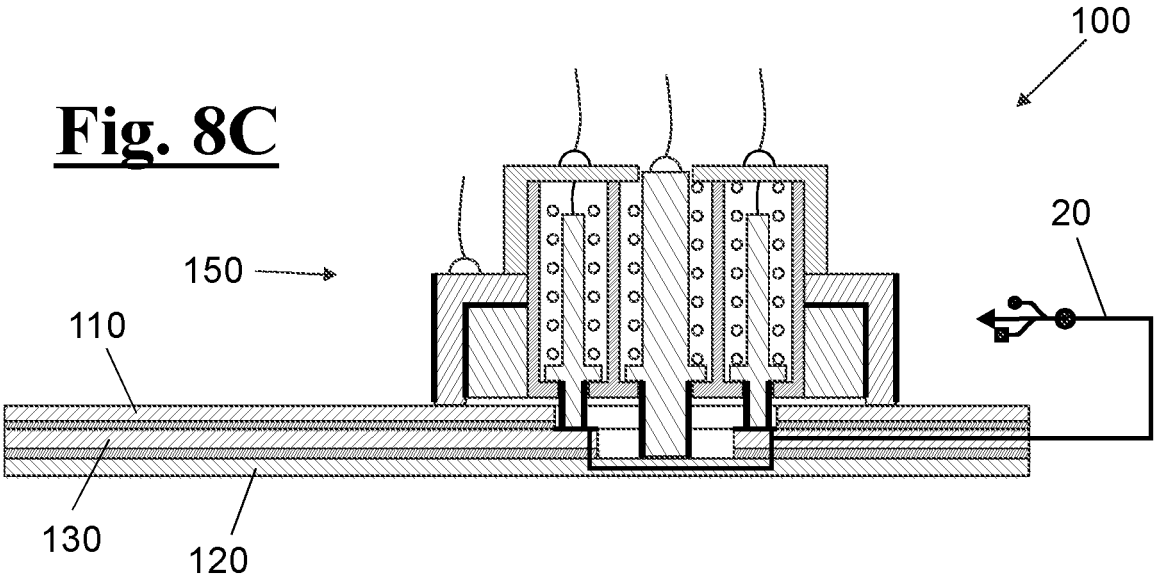


Fig. 8C

Fig. 9A

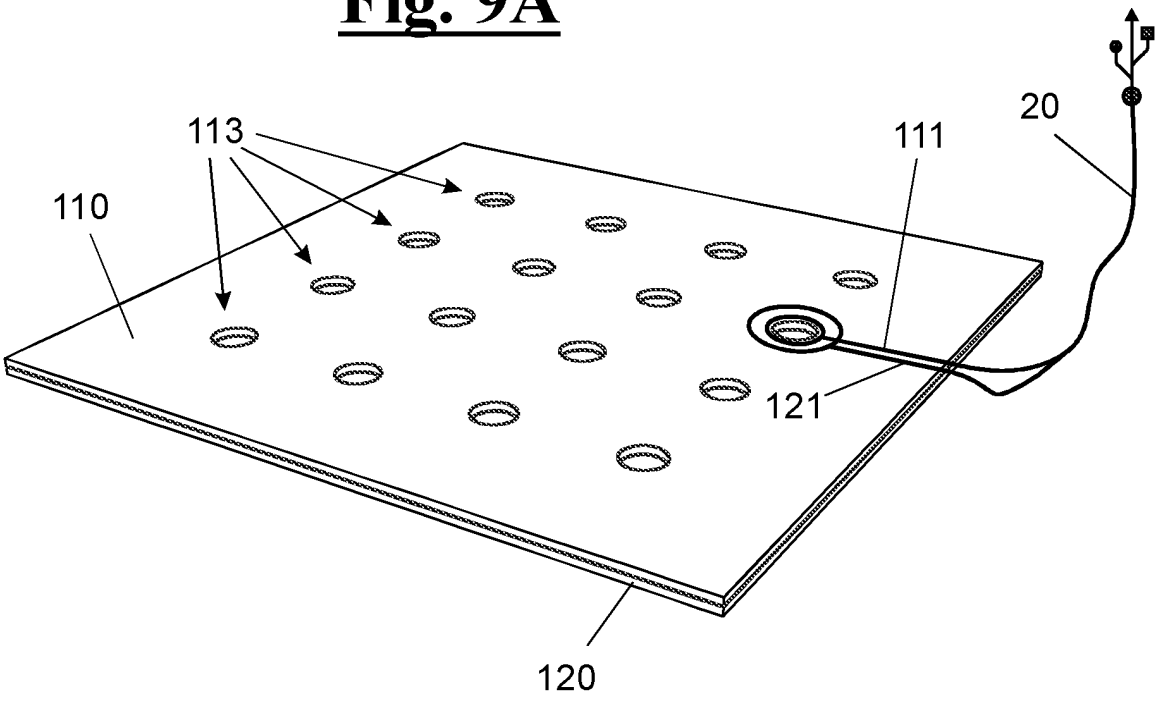
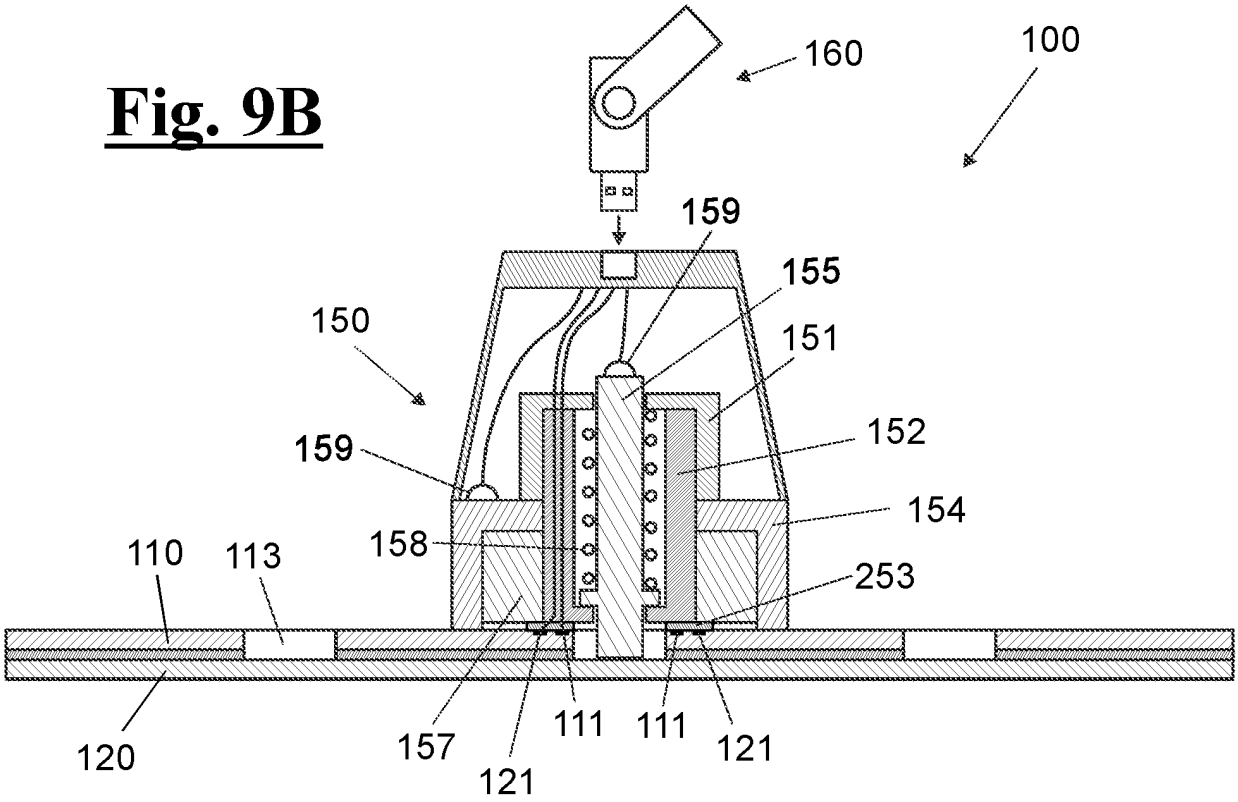

113
110
111
20
121
120

Fig. 9B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121

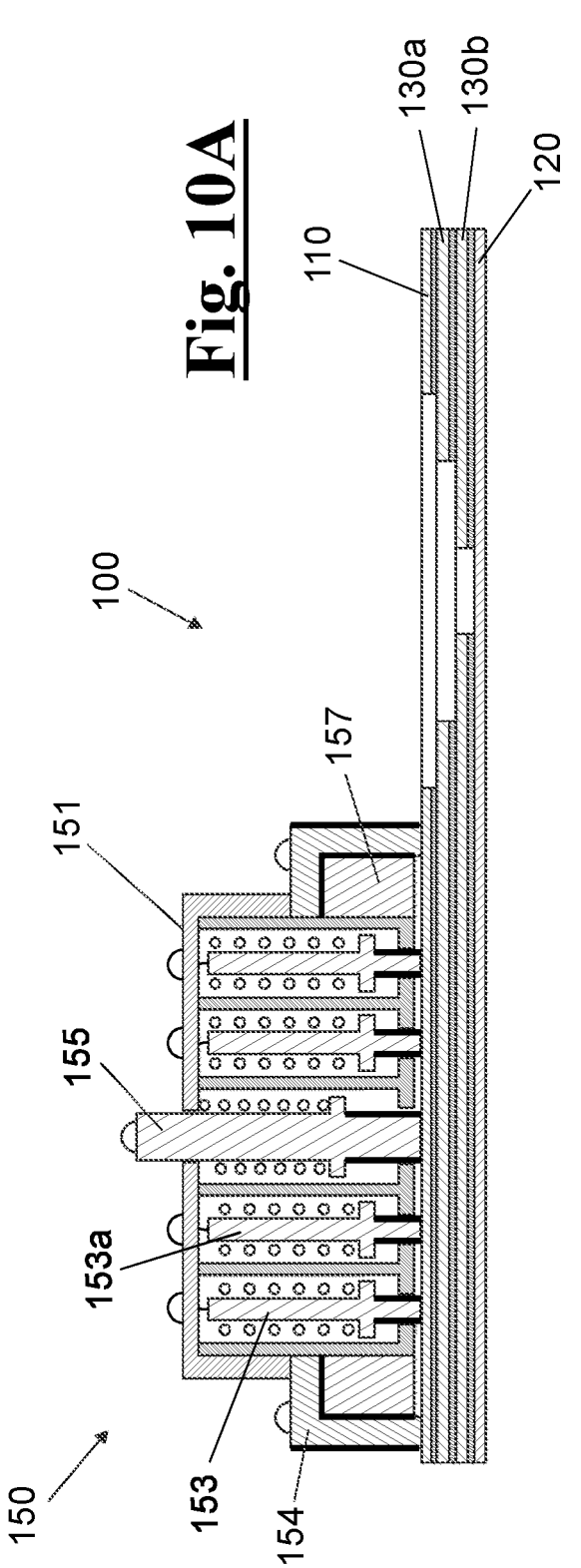


Fig. 10A

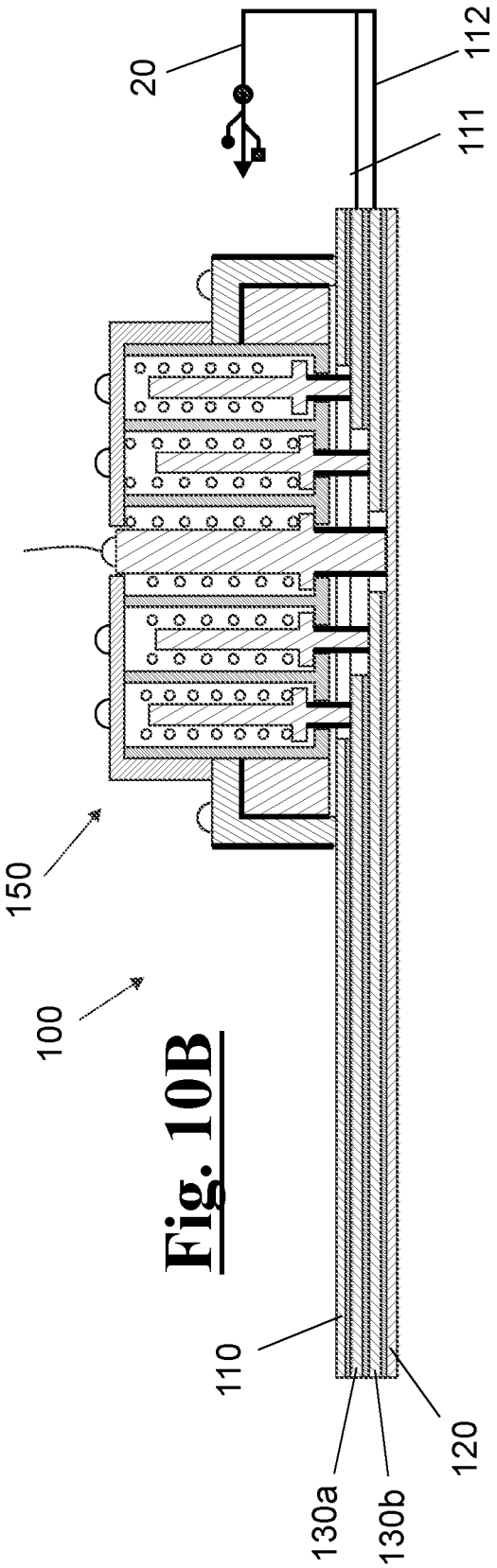


Fig. 10B

Fig. 11A

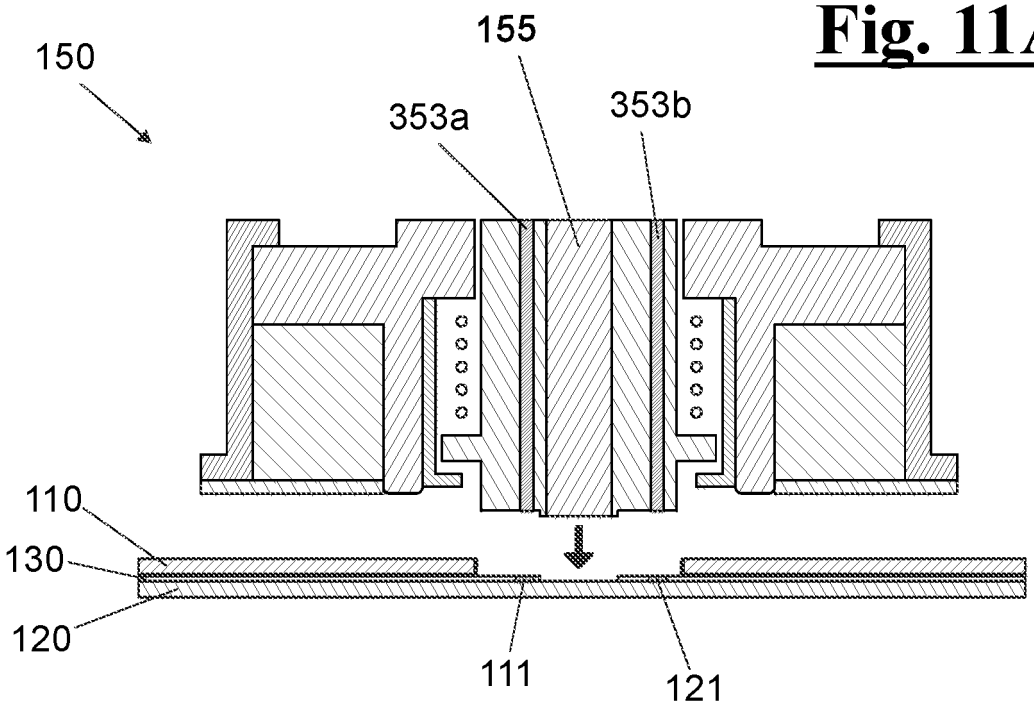
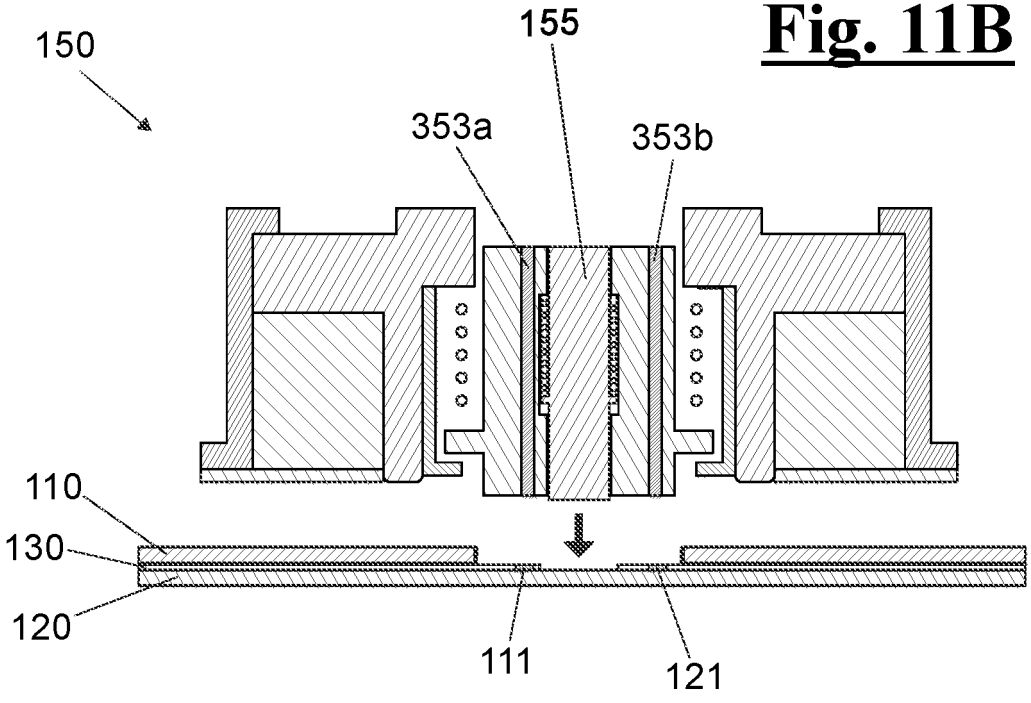


Fig. 11B



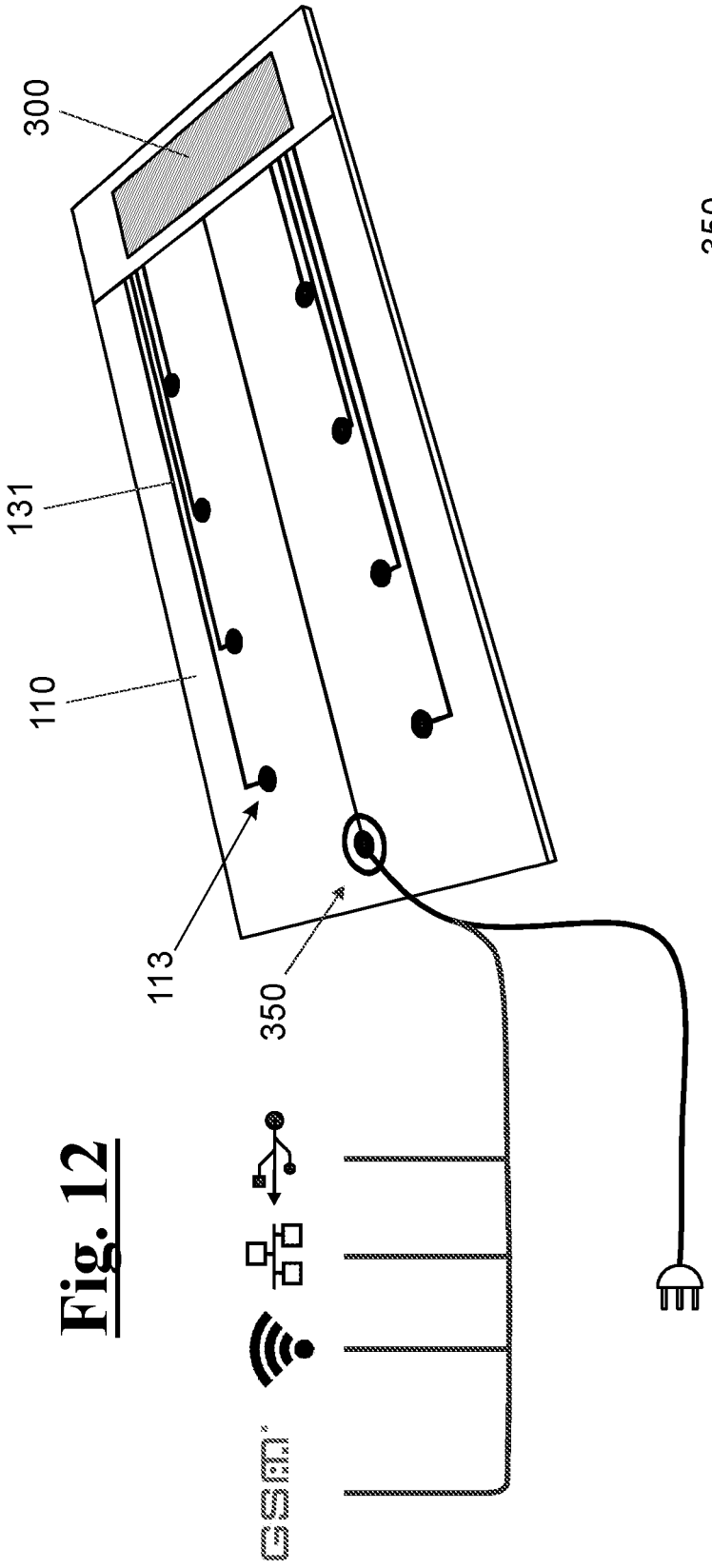


Fig. 12

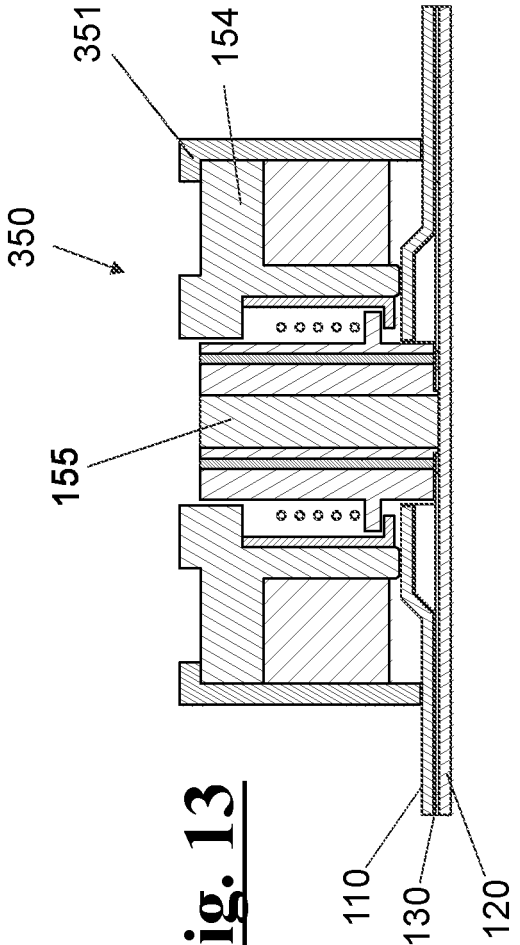


Fig. 13

Fig. 14

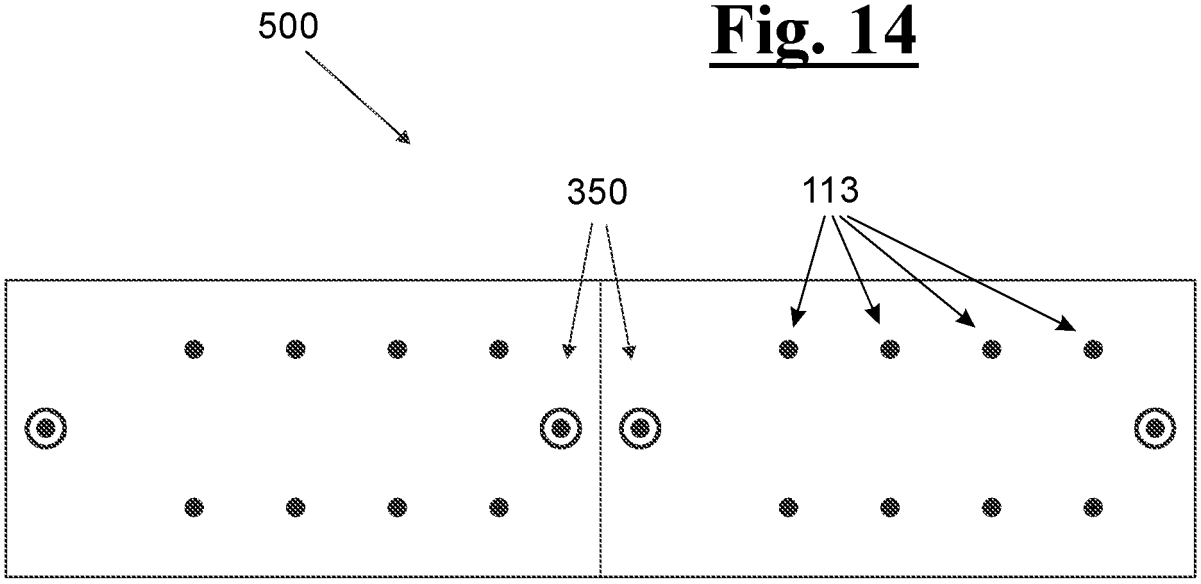
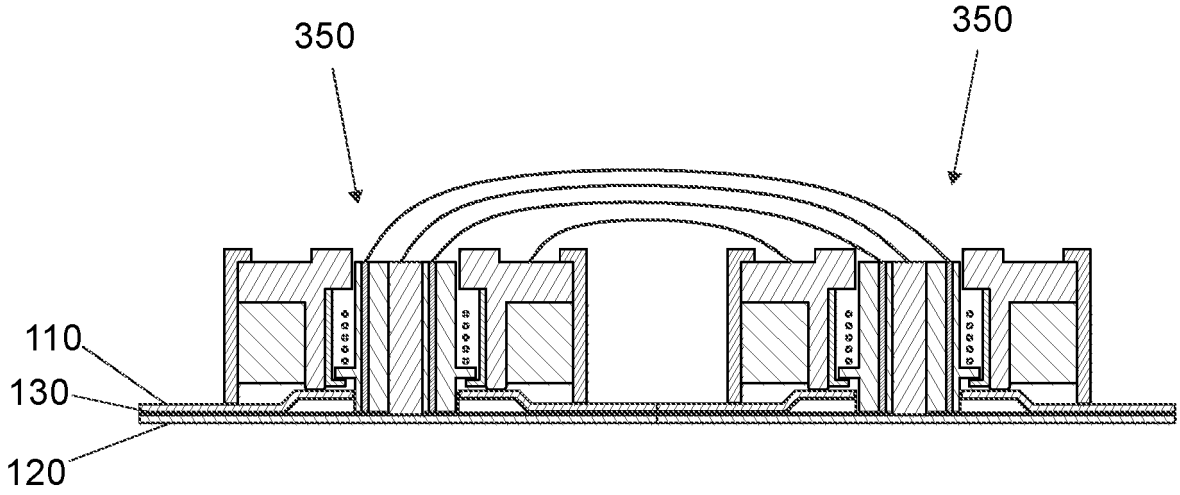


Fig. 15



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